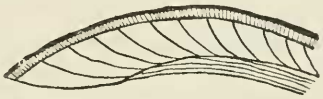
elements of growth of this layer are *diagonal* to the general surface of the shell. From the pallial line to the beaks is deposited the fourth, or intra-pallial layer—the elements of which are parallel to the general surface. The sectionized shell will show the extra-pallial layer wedge-shaped, with the apex at beak, and base occupying the distance from the pallial line to the margin, while the intra-pallial layer is also wedge-shaped, with its apex at the pallial line.

Because the pallial line is composed of very many small muscle-scars disposed in a line, if the two layers could be separated, a sur-



face would be exposed "radially ridged." Sometimes, by decay, this separation is effected, partially, near the beaks, and the "false beaks" so exposed are strikingly "radially ridged"—so much so as to deceive an expert like Dr. Lea. If a thick-shelled *Unio* like *Quadrula trigona* be burnt, this structure can be very readily demonstrated.

It is not impossible that this appearance of decayed or fossilized *Unios* has given rise to the opinion, as stated by Mr. Chas. T. Simpson, that the primeval *Unios* were provided with "radial beak-sculpturing." The difficulty experienced by every collector of obtaining living shells showing beak-sculpturing, and the *a priori* improbability of fossil shells retaining this very perishable character, lends an air of probability to the above theory, which may be further strengthened by the curious fact that *no* North American *Unio* retains the slightest tendency to show their beaks so sculptured.

LAND SHELLS OF MT. DESERT, MAINE.

BY H. S. COLTON.

On Mt. Desert Island last summer I found land shells in six localities. At Hall's Quarries I found *Zonitoides arboreus* near the shore at the edge of the woods. From Seal Harbor I received *Vitrea hammonis* Strom, *Pyramidula striatella* Anth., *Helicodiscus lineatus* Say and *Carychium exiguum* Say. At Coryledge point under boards within a yard or two of the place where the beach began, I found

Pupa muscorum in untold numbers, *Cochlicopa lubrica* Müll, *Vitrea hammonis* Strom, *Zonitoides arboreus* Say and *Succinea obliqua* Say. At Southwest Harbor Village, under planks, by the road-side I found:

Vitrea hammonis Ström.
Zonitoides arboreus Say.
Zonitoides milium Morse.
Vitrina limpida Gld.
Euconulus fulvus Müll.
Strobilops labyrinthica Say.
Vertigo ventricosa Morse.
Sphyradium edendulum Drap.
Cochlicopa lubrica Müll.
Pyramidula striatella Anth.
Vallonia excentrica Sterki.

The great majority of the species that I found were in Sea Wall and McKinley Villages. These two villages were about three miles apart. Here the conditions were the same. New board-walks were being built along the road and the planks of the old one were thrown into the gutter and into the adjoining fields. I found the following under these boards or in the grass near the boards:

Sea Wall Village.	*McKinley Village.*
Vallonia excentrica Sterki, abun.	*Vallonia excentrica* Sterki.
Pupa muscorum L., abundant.	*Vertigo ventricosa* Morse.
Cochlicopa lubrica Müll, abun.	*Cochlicopa lubrica* Müll.
Vitrina limpida Gld. abun.	*Vitrina limpida* Gld.
Vitrea hammonis Ström.	*Vitrea hammonis* Ström.
Euconulus fulvus Müll.	*Euconulus fulvus* Müll.
Zonitoides arboreus Say.	*Zonitoides arboreus* Say.
Zonitoides exiguus Stimp.	*Agriolimax agrestis* L.
Agriolimax compestris Binn.	*Agriolimax compestris* Binn.
Pyramidula striatella Anth.	*Pyramidula striatella* Anth.
Helicodiscus lineatus Say.	*Helicodiscus lineatus* Say.
Succinea obliqua Say.	*Succinea obliqua* Say.
Succinea avara Say.	*Succinea avara* Say.
Acanthinula harpa Say.	*Acanthinula harpa* Say.

I visited a number of islands but explored only a few carefully. I spent an hour on the evergreen woods of Suttons and found a few *Zonitoides arboreus* Say. An hour on Baker's Island, an hour on Black Island and six hours on Little Goat's Island, revealed me nothing. On Little Ram Island, a rock about a hundred feet long covered with about three feet of soil which supports a number of dead spruce trees, I got *Zonitoides arboreus* and *Succinea obliqua* under some dead wood. On Greening's Island, where I lived and explored

most carefully, I discovered two specimens of *Succinea avara* Say under a board in a swamp. On Little Cranberry Island, under boards near the woods, I found:

Cochlicopa lubrica Müll.
Vitrea hammonis Ström.
Euconulus fulvus Müll.
Agriolimax compestris Binn.
Pyramidula striatella Anth.
Succinea avara Say.

With the exception of the places where the board-walk was being repaired, land shells were the most plentiful on great Cranberry Island. The island is shaped like the letter G and is about four miles long. I explored the western part of the island or the back of the G most carefully. The western shore is composed of ledges of solid rock behind which lies an extensive bog. Where the rock wall is low the surf has built "sea walls" by piling up cobblestones, making a steep beach back of which lies the swamp. This swamp and the higher places near the shore are covered with grass, on top of which the sea in times of storm has cast old planks, stumps, boxes and all kinds of rubbish. It was under these that the shells were found. There was one exception however. *Pyramidula alternata* Say, I found under stones. I found them within a foot of where the vegetation ended and the rocks began that went down to the sea. Indeed all the species enumerated below were found within twenty feet of the beach. Sprinkled through the grass are the shells of *Buccinum undatum*, *Littorina* and *Mytilus edulis*. Some have been washed up, others have been carried by the crows and gulls. It has been suggested that it is owing to the abundance of calcium carbonate in the soil due to these decomposing shells that land shells are so very abundant at the edge of the sea.

Vallonia costata Müll.
Pupa muscorum L.
Cochlicopa lubrica Müll.
Vitrea hammonis Ström.
Zonitoides arboreus Say.
Euconulus fulvus Müll.
Agriolimax compestris Binn.
Pyramidula alternata Say.
Pyramidula striatella Anth.
Helicodiscus lineatus Say.
Succinea obliqua Say.

Little Duck Island lies about eight miles to the southward of Mt. Desert and is the most isolated that I visited. It is about a half a mile in diameter and is half covered with a dense growth of woods, principally spruce. Half is bare of trees and is covered with coarse grass, granite ledges out-cropping here and there. Between the woods and the field there is an area of trees. It was here under

sticks that I found nearly everything. I did however find *Zonitoides arboreus* Say and two specimens of *Helix hortensis* and *P. alternata* Say away from any trees. A year ago *Succinea obliqua* was found in great abundance around a spring, but I did not notice them there this year. This year I found them in the area of dead wood.

Pupa muscorum L.
Cochlicopa lubrica Müll.
Euconulus fulvus Müll.
Zonitoides arboreus Say.
Vitrea hammonis Ström.
Helix hortensis Müll!
Pyramidula alternata Say.
Pyramidula striatella Anth.
Helicodiscus lineatus Say.
Succinea obliqua Say.

NEW LAND SNAILS FROM SOUTH AMERICA.

BY C. F. ANCEY.

Bulimulus ephippium Anc.

Testa anguste et profunde perforato (perforatio supra columellari margine obtecta), conoideo-ovata, tenuissima, papyracea, sericea, parum micans, pallide fulvo-lutea, concolor, obsolete et oblique pliculosa, plicis parum regularibus. Spira regulariter conoidea, apice obtusiusculo, microscopice spiraliter striato atque longitudinaliter undulato. Anfractus 6 convexiusculi, sutura impressa, ultimus amplus, initio vix subangulatus, subattenuatus, antice leniter et longiuscule deflexus. Apertura ovata, superne subattenuata et angulata. Peristoma tenue, brevissime expansiusculum, haud reflexum, margine columellari late in trianguli forma dilatato, callo parietali nullo.

Long. $20\frac{1}{2}$, diam. 12, alt. apert. (oblique) $11\frac{1}{2}$ mill.

Hab. Bahia, Brazil (teste H. Fulton).

This is a member of the Eudioptus section.

Bulimulus goniotropis, n. sp.

Testa angustissime perforata, pyramidata, fulvo-cornea, concolor, tenuis, microscopice et confertim spiraliter impressa, striis vix perspicuis, haud profunde incisis, lineis incrementi obliquis subnotato, nitidula. Spira regulariter conica, producta, lateribus rectis, apice sat minuto, oblique et flexuose costulato et striis microscopicis spiralibus sculpto. Anfractus 7 planiusculi, regulariter crescentes, sutura appressa linea impressa marginata divisi, ultimus medio angulatus, infra convexo-declivis, supra angulum vix convexus. Apertura ob-